REMARKS

The present application includes claims 1-22. Claims 1-22 were rejected by the Examiner. By this amendment, claim 21 has been amended.

Claims 1-2, 4-6, 11-12, 14-16, and 21-22 were rejected under 35 U.S.C. §102(b) as being anticipated by Iizuka et al. (U.S. Patent No. 5,355,887).

Claims 3, 7-10, 13, and 17-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Iizuka and further in view of Yamazaki (U.S. Patent No. 5,622,174).

By this Amendment, independent claim 21 has been amended to reflect that user input is responsible for overlay of the pattern of indicia on the displayed image. None of the prior art teaches or suggests, among other things, allowing a user to overlay first pattern of indicia on a displayed image. This amendment adds no new matter to the claims.

The Applicant first turns to the Examiner's rejection of claims 1-2, 4-6, 11-12, 14-16, and 21-22 under 35 U.S.C. §102(b) as being anticipated by Iizuka.

Iizuka relates to an ultrasonic diagnostic apparatus capable of displaying characteristics and properties of tissue. Iizuka displays displacement of tissue cause by heartbeat or external pressure in real-time by calculating minute displacement of displacement differential of tissue (Abstract, col. 2, lines 51-63). The ultrasonic diagnostic apparatus of Iizuka displays displacements of points occurring at a certain time along with maximum displacement and hardness of tissue, the velocity of propagation of vibrations through tissues, and the direction and magnitude of movement of tissues (col. 5, lines 58-66). Through data in memory, a desired point and direction are selected, as

shown in Figures 9(a) – 9(d) and 10(e) – 10(g) (col. 11, lines 33-68, col. 12, lines 1-3). Detected data is used to generate a graph showing displacement and gradient for the point (13, lines 18-65). Rather than allowing a user to overlay an image on a display with a first pattern or set of indicia, Iizuka simply selects a data point from memory and generates a displacement and gradient graph, as shown in the figures and described in the specification.

Iizuka does not teach or suggest a user interface as described in the claims of the pending application. Iizuka does not teach or suggest a user interface that enables a user to overlay an image on a display with a first pattern of indicia corresponding to sampled anatomical locations within a moving structure. Iizuka does not contemplate, nor does it anticipate, providing the capability for a user to determine the set or pattern of indicia with which to overlay an image on a display. Rather, Iizuka calculates the minute displacement of each point in a cross section and then determines the local maximums in order to display the local maximums (col. 8, lines 59-68, col. 9, lines 1-52). Some variations are discussed, but none mention or suggest the user interface and overlaying capability by the user as described in the claimed invention.

Overlay is not shown in or discussed in relation to the Figures of Iizuka. Rather, the system of Iizuka generates a graph of displacement and gradient for selected points, as shown in Figures 14(a) – 14(d) (col. 13, lines 18-65). Figures 7(a) – 7(c) are mentioned in the background of Iizuka with an explanation of the prior art and do not illustrate one or more patterns of indicia or any overlay with an image on a display. Rather, the figures, as described in column 2, simply reflect shading in an image.

Thus, Iizuka and the prior art do not teach or suggest the limitations of the claimed invention. For example, the prior art does not teach or suggest enabling a user of the machine to overlay an image on a display with a first pattern of indicia corresponding to sampled anatomical locations within a moving structure and then generating parameter signals and a second pattern of indicia corresponding to the displacement of the anatomical locations in response to the parameter signals. The prior art does not teach or suggest then displaying the second pattern of indicia overlaid on the image. The prior art also does not teach or suggest displaying an image and pattern of indicia in a predetermined geometry, as recited in dependent claims 4-6 and 14-16. The prior art does not teach or suggest a pattern of indicia comprising lines that are equidistant apart, as recited in claims 6 and 16. Therefore, the Applicant respectfully submits that claims 1, 2, 4-6, 11, 12, 14-16, 21, and 22 should be allowable.

The Applicant next turns to the Examiner's rejection of claims 3, 7-10, 13, and 17-20 under 35 U.S.C. §103(a) as being unpatentable over Iizuka and further in view of Yamazaki. As described above, Iizuka does not teach or suggest claims 1-2, 4-6, 11-12, 14-16, and 21-22 of the present application. Additionally, the above reasoning shows that Iizuka does not teach or suggest the limitations of dependent claims 3, 7-10, 13, and 17-20. For example, Iizuka does not teach or suggest determining both distance moved and deformation of the moving structure as recited in claims 3 and 13. Rather, Iizuka records distance and direction moved of a selected point resulting in a displacement and gradient graph. As mentioned by the Examiner, Iizuka does not discuss deformation of the moving structure at all. Iizuka also does not teach or suggest all of the limitations

recited in dependent claims 7-10 and 17-20, such as summing a set of signal values representing mean velocities of a moving structure over a period of time.

Yamazaki relates to a system for calculating movement velocities for a sampling volume based on ultrasonic echo signals and then displaying in color the movement velocities (Abstract). Yamazaki detects movement or absolute velocity in an ultrasonic beam direction for a color flow ultrasound display (col. 2, lines 39-47). Thus, the system of Yamazaki translates organ movement velocity into color and displays the movement velocities in an ultrasonic display (col. 3, lines 6-15).

However, Yamazaki does not teach or suggest the limitations of the claimed invention. For example, Yamazaki does not teach or suggest overlaying a pattern of indicia on a displayed image based on user selection. No user interface is mentioned or suggested in Yamazaki allowing a user to overlay the image on the display with a first pattern of indicia corresponding to sampled anatomical locations within the moving structure. These and other elements represent novel improvements over the prior art that are claimed in the present application. Furthermore, the teachings of Yamazaki do not cure the defects in Iizuka, and, thus, a combination of Yamazaki with Iizuka would neither teach nor suggest the limitations of the claimed invention, such as those recited above. Therefore, the Applicant respectfully submits that claims 3, 7-10, 13, and 17-20 should be allowable.

CONCLUSION

Accordingly, the application now believed to be in condition for allowance and an action to this effect is respectfully requested. If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited and encouraged to contact the Applicant at the number below. Please charge any additional fees or credit overpayment to the Deposit Account of GTC, Account No. 070845.

Respectfully submitted,

Date: May 4, 2004

Christopher N. George
Registration No. 51, 728

MCANDREWS, HELD, & MALLOY, LTD.
500 West Madison Street, 34th Floor
Chicago, IL 60661
Telephone: (312) 775-8000
Facsimile: (312) 775-8100